08/21/2007

DESIGN ANALYSIS REPORT
ASARCO EAST HELENA
CORRECTIVE ACTION MANAGEMENT UNIT (CAMU)
PHASE 2 CELL

Prepared For:

ASARCO LLC
P.O. Box 1230
East Helena, MT 59635

Hydrometrics, Inc.
consulting scientists and engineers

JANUARY 2007

REVISED MAY 2007

REVISED JUNE 2007

REVISED AUGUST 2007

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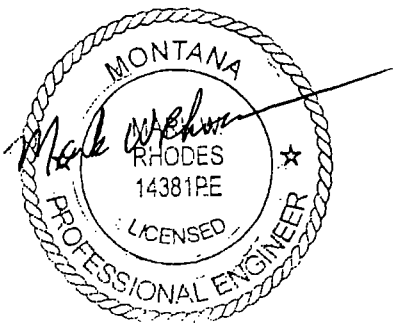

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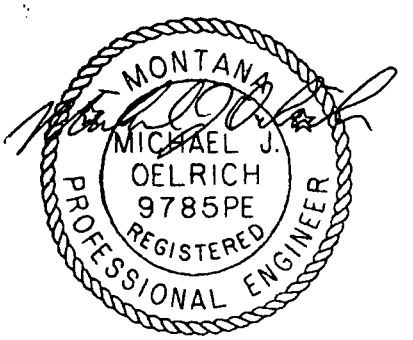

January 2007
Revised May 2007
Revised June 2007
Revised August 2007

Comment 9. ASARCO must place restrictions on the deeds for both CAMU cells by October 1, 2007.

Response: Asarco acknowledges the requirement to have restrictions on the deeds for both CAMU cells by October 1, 2008.

CAMU Phase 2 Cell facility . . . will be fenced with a 6-foot high welded wire farm fence with a single strand barbed wire top section until completion of the final cap when a 6-foot high chain link fence with a 3-strand barbed wire top section will be used. Gates (24 feet wide) will be provided at the access roads. Project signs will be installed on each of the four sides of the CAMU Phase 2 Cell perimeter fence. Temporary orange poly fence (safety fence) will be installed around the Asarco East Helena Smelter facility perimeter in places where demolition leads to gaps in the facility fence. Temporary fence should be used for the shortest duration possible and should be replaced with permanent facility fencing quickly to increase site security." *The project drawings, which have been included in the report as Appendix I, include details for anchorage of the temporary cap, which are similar to what has been used at the facility except that the edges will be anchored in a trench rather than with batton strips. The 6-foot high welded wire farm fence is designed to keep deer and other animals off the temporary cap.*

Comment 3. Page 5-1, 5.0 Temporary Closure and Monitoring, please amend the text to include the following items for the temporary cap: type of cushion layer, installation method, prevention of precipitation, site security, freezing effects, wind, and animal intrusion.

*Response: Section 5 has been revised to read, "**The construction of the CAMU Phase 2 Cell is scheduled to begin in 2008. Once the cell is excavated and the liner, leak detection, and leachate collection systems are constructed the cell will be filled with waste materials from both 2006 and 2007 demolition work. Placement of waste materials generated from 2006 demolition work will free up containment building storage space that may be used to store waste materials generated from demolition work after temporary closure of the CAMU cell before the end of the 2008 construction season. By the end of the 2008 construction season, a temporary cap constructed from 20 mil Reinforced Polyethylene (RPE 25) with stitched z-fold seams will be placed over the waste, using sandbags to hold it in place. Prior to placement of the liner, the surface of the waste will be graded to drain, rolled smooth, and covered with a 10-ounce cushion fabric. Sandbags placed in a 5-foot grid will be installed to anchor the middle portion of the cap and edges will be anchored in trenches. The cell has been designed to contain 40,000 cubic yards of material in the excavated portion of the cell. This will allow the contractor to grade the waste material level with the existing ground surrounding the CAMU Phase 2 Cell, which will help to promote runoff from the temporary cover. The temporary RPE 25 cap may also be used at the conclusion of subsequent construction seasons if it is stored carefully in between uses. However, the cushion fabric will need to be replaced. Freezing and wind and other weather related damage may limit the useful life of the temporary cap, in which case, a new cap will need to be provided.*

VI. Final Cap

Comment 1. 3.5 Component Design: The design report must be updated to include additional information on the proposed cap including the GCL. The geosynthetic clay liner should be needle punch reinforced GCL comprised of a uniform layer of granular sodium bentonite encapsulated between a scrim reinforced non-woven and a virgin

VIII. General Provisions for Design Revision

Comment 1. ASARCO should provide a more detailed construction schedule similar to Figure 4-1 Construction Schedule in the Phase I Design.

Response: Asarco does not have a more detailed schedule, other than the milestones that the contractor is being required to meet, which are July 15, 2007 for the Stage I Cleaning and Demolition, October 15, 2007 for the Stage 2 Cleaning and Demolition, October 15, 2008 for the CAMU Construction, which includes waste placement and temporary capping, and December 1, 2008 for all other items. These dates were based on an April 1, 2007 start date, which has changed as the CAMU Design Report is being finalized.

Comment 2. 3.5, Component Design: This section states that the landfill has been designed and constructed pursuant to EPA and Department guidance. However, 8.0 References does not reference any Department guidance. Please specify the Department guidance that ASARCO is using. Please revise 8.0 References, to reflect all materials and guidance relied upon during development of this design plan.

Response: We have added the Department guidance, referenced in the comments within this document to Section 8. At the time Section 8 was initially written, Asarco and Hydrometrics, Inc. believed that the Department's response to Hydrometrics' June 16, 2006 letter that stated our intention of designing the CAMU Phase 2 CAMU Cell "much the same as the previous one" gave us permission to use the same design standards as the CAMU Phase 1 Cell. Therefore as in CAMU Phase 1 Cell, department guidance was not referenced. Design of a CAMU Phase 2 Cell to differing state and federal standards to both Hazardous and Municipal waste guidance and standards to comply with good design practices presents unique challenges.

Comment 3. Page 7-1, 7.0 Standard Plans and Specifications, please amend this section to reflect the revisions required elsewhere throughout the document and responsive to state and EPA comments.

Response: Plans and specifications have been revised to reflect the revisions required elsewhere throughout this document. Primarily these changes include:

- *Change the smooth 60 mil HDPE FML to **Double-Sided (DS) Textured 60 mil HDPE FML.***
- *Add **reinforced GCL** between the compacted clay liner (CCL) and the bottom.*
- *Increase the cushion material layer thickness to **24".***
- *Crushed brick or concrete **will not** be allowed as cushion material. Crushed slag, imported gravel, or select fill from the CAMU Phase 2 Cell excavation **will be** allowed as cushion material.*
- Change the size specification for cushion material from minus 3/8" to **minus ½". However, the first 12" of the cushion layer must consist solely of material less than ½" but larger than ¼".**
- Contractor must have local readily available pumps capable of pumping **400 gpm** on standby in the event of a significant rainfall.

3.0 CAMU DESIGN

This design analysis addresses the CAMU Phase 2 Cell that will be constructed in 2008 to contain demolition debris and waste soils from current remedial cleanup activities. The location of the CAMU Phase 2 Cell is shown on Figure 3-1.

Most of the elements of CAMU Phase 2 Cell design were addressed in the CAMU Phase 1 Cell Design Report (Hydrometrics, 2000) approved by EPA in July 2000. Additional information addressed in this Design Analysis Report includes:

- Location of the CAMU Phase 2 Cell.
- Borehole and Test pit excavation and soil testing for CAMU Phase 2 Cell compacted clay liner construction (Section 3.2).
- Construction of three additional wells to better define site stratigraphy and groundwater flow conditions (Section 3.3).
- Changes to design of the Leachate Collection and Leak Detection Removal Designs.

3.1 SITE SELECTION

An examination of site soils adjacent to the CAMU Phase 1 Cell was completed in September 2006, and indicates that the area immediately south/southeast of the CAMU Phase 1 Cell is well suited as the site for the CAMU Phase 2 Cell. Further discussion of the CAMU Phase 2 Cell site location is found in the CAMU Phase 2 Cell Geotechnical Investigation (Hydrometrics, 2006). As required by either 40 CFR 264.18 or ARM 17.50.505, the proposed site, shown on Figure 3-1, has **no**:

- Wetlands
- Floodplains
- Faults
- Instability
- Underlying rock fractures or fissures

5.0 TEMPORARY CLOSURE AND MONITORING

The construction of the CAMU Phase 2 Cell will begin in 2008. Once the cell is excavated and the liner, leak detection, and leachate collection systems are constructed the cell will be filled with waste materials from both 2006 and 2007 demolition work. Placement of waste materials generated from 2006 demolition work will free up containment building storage space that may be used to store waste materials generated from demolition work after temporary closure of the CAMU cell before the end of the 2008 construction season. By the end of the 2008 construction season, a temporary cap constructed from 20 mil Reinforced Polyethylene (RPE 25) with stitched z-fold seams will be placed over the waste, using sandbags to hold it in place. Prior to placement of the liner, the surface of the waste will be graded to drain, rolled smooth, and covered with a 10-ounce cushion fabric. Sandbags placed in a 5-foot grid will be installed to anchor the middle portion of the cap and edges will be anchored in trenches. The cell has been designed to contain 40,000 cubic yards of material in the excavated portion of the cell. This will allow the contractor to grade the waste material level with the existing ground surrounding the CAMU Phase 2 Cell which will help to promote runoff from the temporary cover. The temporary RPE 25 cap may also be used at the conclusion of subsequent construction seasons if it is stored carefully in between uses. However, the cushion fabric will need to be replaced. Freezing and wind and other weather related damage may limit the useful life of the temporary cap.

This temporary component of the CAMU Phase 2 Cell cap will help to reduce infiltration of precipitation into the waste material until final capping of the CAMU Phase 2 Cell is completed. If it is to be reused, the liner may be divided into small enough panels to remove from the CAMU and then reanchored with sandbags on adjacent land that is out of the way of construction. The liner will need to be inspected prior to reuse in order to insure that it is still in adequate condition for use. If it is determined that it is not in a sufficient condition to be reused, it will need to be well perforated so that it will not hold water, prior to placing it in the CAMU cell, or placed over the top of the waste material prior to capping the cell. The 10-ounce cushion fabric, which is not reusable, will be cut into pieces 36 square feet or smaller, placed flat and distributed evenly throughout the cell. The Operation and Maintenance Plan (O&M Plan) addresses temporary closure activities of the CAMU and is located in Appendix E.

APPENDIX E

OPERATING PLAN
ASARCO EAST HELENA
CORRECTIVE ACTION MANAGEMENT UNIT (CAMU)

Prepared for:

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TABLE OF CONTENTS

LIST OF ATTACHMENTS iii
1.0 GENERAL INFORMATION 1-1
1.1 PURPOSE 1-1
1.2 RESPONSIBILITY 1-2
1.3 COMMUNICATIONS 1-2
1.4 OPERATING LOG 1-3
1.5 PUBLIC SAFETY AND HEALTH 1-3
2.0 CONSTRUCTION INFORMATION 2-1
3.0 WASTE HAULING AND DUST CONTROL 3-1
3.1 ON-SITE TRANSPORT 3-1
3.2 OFF-SITE PREPARATION AND TRANSPORT 3-1
3.3 PLACEMENT OF WASTE 3-2
3.4 CONTINGENCY PLAN 3-2
3.5 WASTES REQUIRING SPECIAL MANAGEMENT 3-2
3.6 WORK STOPPAGE 3-3
3.7 DECONTAMINATION AND INSPECTION OF EQUIPMENT 3-4
3.7.1 Work and Road Surface Cleaning 3-5
3.8 SPILL MITIGATION 3-5
4.0 SITE MONITORING AND INSPECTION 4-1
4.1 SITE INSPECTIONS – OPERATION 4-1
4.1.1 Daily Inspections 4-1
4.1.2 Weekly Inspections 4-1
5.0 SITE MAINTENANCE 5-1
5.1 CAMU TEMPORARY CAP 5-1
5.1.1 Housekeeping 5-1
5.1.2 Corrective Maintenance 5-1
5.1.3 Groundwater 5-2

LIST OF ATTACHMENTS

ATTACHMENT A ASBESTOS PROCEDURES

ATTACHMENT B INSPECTION FORM AND SITE MAP

ATTACHMENT C SAMPLING AND ANALYSIS PLAN

APPENDIX E

OPERATING PLAN
ASARCO EAST HELENA
CORRECTIVE ACTION MANAGEMENT UNIT (CAMU)

1.0 GENERAL INFORMATION

This plan addresses care, operation, monitoring, and maintenance of the Corrective Action Management Unit (CAMU) and is included as Appendix E of the Design Analysis Report Asarco East Helena Corrective Action Management Unit (CAMU) Phase 2 Cell. The CAMU is located adjacent to the Asarco East Helena Plant, and south of the community of East Helena, Montana. In 2001 a waste containment facility, known as the CAMU Phase 1 Cell, was constructed for the disposal of soils, sediments and demolition debris resulting primarily from smelter site remedial cleanup activities. In 2008, a second waste containment facility, known as the CAMU Phase 2 Cell, will be constructed adjacent to the Phase 1 Cell, and will contain demolition debris and waste soils from current remedial cleanup activities. Although not required by CAMU regulations, the Phase 1 and Phase 2 Cell were designed to comply with the Resource Conservation and Recovery Act (RCRA), Subtitle C regulations and guidelines.

1.1 PURPOSE

The purpose of this Operation Plan is to set forth the enforceable requirements for operation and maintenance of the CAMU Phase 2 Cell prior to permanent closure of the unit. This Operation, Maintenance, and Waste Hauling Plan establishes specific criteria and response timelines for repair for each inspection element, including notification provisions of required repairs to regulatory agencies; as well as, provides insight and guidance into the measures that will be implemented to properly transport hazardous waste materials from the Asarco East Helena Smelter site to the Corrective Action Management Unit (CAMU) Phase II Cell. This

plan complies with all applicable requirements specified in the Code of Federal Regulations, Title 40, Part 264 – Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR 264). This Operation, Maintenance, and Waste Hauling Plan provides:

1. Basic construction information;
2. A description of all required site inspection and monitoring activities, including the frequency with which each activity will be performed and the corrective actions that will be taken for each problem encountered; and
3. A description of all required site maintenance activities, including the frequency with which each activity will be performed.

In addition, this plan minimizes the need for facility maintenance after the site is closed and controls, minimizes, or eliminates to the extent necessary for protection of human health and the environment, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground, surface waters, or atmosphere. This plan also minimizes the risk to both the environment and human health by addressing the means and methods that will be utilized to implement dust control measures, maintain equipment, and sustain clean work and road surfaces.

1.2 RESPONSIBILITY

Asarco LLC is responsible for implementation of this plan. Asarco LLC is referred to as the owner/operator throughout this plan.

1.3 COMMUNICATIONS

Lines of communication between the contractor, inspectors, and ASARCO will be established before construction of the CAMU cell begins. All communications, inspection logs, and incurred problems shall be documented and copies provided to the owner/operator.

1.4 OPERATING LOG

Asarco LLC will maintain an operating record of all site inspections and maintenance activities as required under 40 CFR 264.73. Communications between the contractor, inspectors, and the owner should be documented and kept as part of the operation log.

1.5 PUBLIC SAFETY AND HEALTH

The CAMU Phase 1 Cell has been closed and is secured by fencing. Like the Phase 1 Cell, the Phase 2 Cell will be fenced and kept secured to control public access to the site. Once the Phase 2 Cell has been closed, the site will pose no special public safety or health hazards. The contractor will be responsible for ensuring that the site is secure and gates and fences will be inspected weekly to keep the site secure.

2.0 CONSTRUCTION INFORMATION

The CAMU Phase 2 Cell consists of the following components listed in order from the bottom to the top of the cap:

1. Secondary Composite Liner
   - 3-foot compacted clay liner (CCL)
   - Reinforced GCL liner
   - 60-mil Double Sided Textured HDPE flexible membrane liner (FML)
2. Leak Detection, Collection, and Removal System
   - Geocomposite Drainage Layer
3. Primary Liner
   - 60-mil Double Sided Textured HDPE flexible membrane liner (FML)
4. Primary Leachate Collection and Removal (PLCR) System
   - Geocomposite Drainage Layer
5. 2-foot Cushion Layer
6. Waste
7. 12-inch Gas Migration Layer
8. Cap Composite Liner
   - Reinforced GCL
   - 40-mil Double Textured HDPE flexible membrane liner
   - Geocomposite
9. Surface Water Collection and Removal (SWCR) System
   - 1-foot thick drainage gravel layer
10. Cover System
    - 2-feet cover soil
    - 6-inches topsoil and
    - Grass cover.

3.0 WASTE HAULING AND DUST CONTROL

Waste Hauling and dust control measures are designed to control the emission of visible fugitive dust. These controls will be accomplished through the use of administrative, engineering, and physical controls. The mitigation of airborne dust generation is considered to be a priority. Throughout the project, the necessary steps will be taken to effectively control dust in the working area during demolition operations. The use of minimum amounts of water will be the main source for dust control. All communications between the contractor, inspectors, and ASARCO should be documented.

3.1 ON-SITE TRANSPORT

Sorting and sizing of demolition debris will occur at the demolition site prior to being loaded in haul trucks. All oversized materials will be reduced at the demolition site and once the debris and material is loaded into haul trucks, no further reduction of materials will be necessary. After demolition debris is loaded into the truck beds, the debris payload will be moistened prior to the vehicle leaving the loading area. The truck beds will utilize sealed tail gates. The use of truck bed covers may be considered if the physical shape of the truck beds accommodate. Transport vehicles will be limited to a maximum of 10 miles per hour while transporting waste across the plant site. Limiting speeds will prevent dust from become airborne during transport and will prevent the kick-up of dust from rolling tire action.

3.2 OFF-SITE PREPARATION AND TRANSPORT

Prior to debris leaving the Asarco Smelter site and being transported to the CAMU, transport vehicles will be run through a scale, sampling station, and moistening station. The haul truck will be weighed on the scale and a sample will be taken from the trucks payload at the interval specified in Attachment C of this Appendix - Sampling and Analysis Plan. The moistening station will consist of a scaffolding platform on which personnel will mist water on the loaded debris as a final step before it travels outside the property fence line and across the County road. The spray will add a final moisture barrier/binder to the debris for the short distance haul to the CAMU. Transport vehicles will be limited to a maximum of 10 miles

per hour during transport. Limiting speeds will prevent dust from become airborne during transport and will prevent the kick-up of from rolling tire action.

3.3 PLACEMENT OF WASTE

Once haul trucks arrive at the CAMU Phase II cell, they will drive into the cell and dump their load in the location specified by the contractor. Asbestos materials are the only materials with a designated location in the CAMU cell and will be placed in this location as directed by the contractor. A water truck will be located close to the CAMU cell to lightly mist debris and knock down any dust during the dumping and spreading phase of the debris in the CAMU. Use of water will be kept to a minimum. Additional water will be applied to locations in the CAMU to eliminate the potential for fugitive dust emissions. Waste will be placed in the CAMU cell in two-foot lifts and compacted according to Project Specifications. Inspections of the CAMU cell will occur at least twice daily to assess the potential for windblown dispersion of fugitive dust. Water will be applied to areas of the cell where fugitive dust could potentially or is found to be a problem.

3.4 CONTINGENCY PLAN

If the CAMU is not immediately available for waste placement, CAMU destine-waste will be transported to and staged inside designated facilities that meet 40 CFR 265 Subpart DD, Containment Building requirements. Waste material will be transported as previously described and will be dumped into bulk stockpiles. The designated facilities will provide protection from weather, specifically wind and rain. Therefore, inside the facilities, materials will not be covered and dust mitigation will not be necessary. Once the CAMU is ready to accept material, stockpiled waste will be transported from the designated facilities to the CAMU as previously described.

3.5 WASTES REQUIRING SPECIAL MANAGEMENT

Wastes requiring special management include; asbestos, flue dust, and acidic waste. Proper procedures for pretreatment and packaging these wastes will be conducted in the demolition areas prior to the materials being loaded on haul trucks. Acidic waste will be neutralized

using lime rock and loaded into haul trucks and hauled to the CAMU cell. Asbestos containing products and flue dust will be handled according to the procedures outlined in Sections 5.0 and 6.0 of the Blast Furnace Flue and Monier Flue Cleaning, Demolition, and Soil Sampling Work Plan (Asarco 2007). These procedures outlined in Sections 5.0 and 6.0 are included as Attachment A. All Friable asbestos that is wrapped and contained, will be loaded, transported, and placed in the southwest corner of the CAMU cell in such a manner that the integrity of the wrapping is not breached. Once the material has been placed in the cell, its location will be surveyed and then covered with soil to maintain the integrity of the wrapping. The location of the asbestos containing material will be shown on the as-built drawings of the CAMU Phase 2 Cell and this drawing will be included in the deed restriction. At no time will friable material be exposed to the environment. Non-friable asbestos waste will be loaded and transported as described above for general demolition debris.

3.6 WORK STOPPAGE

Work shall halt when weather conditions are such that the spread of contaminated dust and debris is likely. These conditions typically exist when there is excessive wind and/or rain. Therefore, if wind with sustained readings of 15 MPH (average hourly rate) or more evolve, the handling and hauling of waste both on-site and off-site will halt to prevent dust and debris from becoming airborne due to the waste management process. Sustained wind speeds will be monitored by management personnel through the use of a calibrated on-site wind sock; as well as, through data provided by the National Oceanic and Atmospheric Administration (NOAA) at www.noaa.gov for wind speeds at the Helena Airport. Furthermore, if a rain event begins, management personnel will evaluate the site conditions. If the rain is such that no run-off is occurring, work activities will proceed uninhibited. In the event that the rain is of such volume that run-off is beginning to occur and the work activities in progress (i.e., waste hauling, placement of waste in CAMU) could create a contaminated run-off, both on-site and off-site work will cease until such time that a run-off potential is not present. The contractor will evaluate these conditions with ASARCO representatives. In the event that

transport is halted, no additional trucks will be loaded and any trucks containing wastes will be covered until conditions improve.

3.7 DECONTAMINATION AND INSPECTION OF EQUIPMENT

Equipment used in the handling and/or transport of demolition debris will be decontaminated prior to the equipment leaving the site, or moving from a demolition zone to an area considered clean. Decontamination pads, a concrete slab suitable for placement of heavy equipment, will be established, in areas agreed upon with and approved by ASARCO representatives. The location of the decontamination pads may change as demolition activities progress. However, all equipment will be decontaminated within close proximity to where it will leave the Asarco Smelter site. Equipment that has been decontaminated will be inspected upon completion to ensure the adequacy of the process and to document the process to ensure quality control prior to the transport vehicle leaving the site.

Decontamination will consist of one or a combination of the following: brushing, vacuuming, or washing methods. The goal of the decontamination is to remove heavy metal laden bearing dust and debris from the areas of the equipment that came into contact with this waste. Upon completion of the decontamination activities, any removed dust and debris residue will be picked up and placed into storage for eventual placement into the CAMU.

Haul trucks leaving the CAMU Phase II cell will be traveling on paved haul roads and will not be decontaminated until they enter the ASARCO smelter facility, where they will be decontaminated on one of the decontamination pads. Any large debris will be knocked off of haul trucks as they leave the CAMU cell. The section of haul road between the CAMU cell and the ASARCO smelter facility will be constantly monitored and swept on a regular basis. This section of haul road will be inspected twice daily.

Transport vehicles will be inspected periodically to ensure that truck beds and gates are properly sealed and that debris is not building up. Full decontamination of vehicles that are leaving the Asarco site should be run periodically.

Equipment used in the CAMU cell for spreading and compacting waste will be decontaminated at the ASARCO smelter facility. This equipment will be placed on trailers and driven via the haul road back to the ASARCO smelter facility, where it will be decontaminated on one of the decontamination pads.

3.7.1 Work and Road Surface Cleaning

Haul roads within the plant site and haul roads used for waste transport will need to be kept clean at all times. A street sweeper designated to cleaning roads and surfaces within the plant site will clean up all loose dust in order to minimize the chances for the off-site migration of dust and debris. This street sweeper will not be used off site of the plant. A second street sweeper designated to keeping CAMU haul roads clean will be run constantly when waste is being hauled. Haul roads will be paved so that waste and debris can easily be cleaned. This will allow for daily visual inspection of haul roads to make sure transport vehicles are being adequately decontaminated and waste is adequately moistened.

3.8 SPILL MITIGATION

Spills of soils or debris being transported to the CAMU will be prevented by constant maintenance of trucks to make sure they are properly sealed and in good working order. In addition, traffic control and slow truck speeds, as previously mentioned will help to prevent accidents from occurring. If waste is spilled in route to the CAMU, the hauling of waste will halt and the spilled waste will be cleaned up using clean decontaminated equipment. If the spill occurs on the haul road, the road will be swept clean. If the spill occurs on soils, follow up soil sampling will be conducted to assure that all the contaminated waste has been cleaned up.

The inspection of the area surrounding the CAMU cell twice daily, will include looking for visible fugitive emissions. If a release from the cell is noticed during an inspection, the waste will be cleaned up using clean decontaminated equipment and placed in the CAMU cell. Excavation of soils where visible waste is noticed will be conducted immediately. Follow up soil sampling will be conducted to assure that all the contaminated waste has been cleaned up.

4.0 SITE MONITORING AND INSPECTION

Inspections will be performed twice daily of areas surrounding the CAMU cell and the haul road between the CAMU and ASARCO smelter facility when the CAMU cell is in operation. Daily inspections of the road used for hauling waste will occur when the haul road is in use. While the CAMU cell is in operation it will be inspected once per week. Quarterly monitoring of groundwater quality and semi-annual site inspections will ensure that public health and safety are maintained at the site. Monitoring and inspection protocol are in accordance with 40 CFR 264.303.

4.1 SITE INSPECTIONS – OPERATION

4.1.1 Daily Inspections

While the landfill is in operation, inspection of the grounds surrounding the CAMU should be inspected twice daily. These inspections should include an assessment of the potential for windblown dispersion of fugitive dust from the CAMU and a visual inspection of the grounds surrounding the CAMU for any visible releases of fugitive dust from the CAMU cell. The haul route used by trucks leaving the CAMU and returning to the ASARCO smelter facility should also be inspected twice daily to ensure that it remains clean and free of dust and debris. The remainder of the haul road should be inspected once per day to ensure that it is free of dust and debris. Daily inspections should be documented and recorded on the Daily Inspection Form included in Attachment B of this Appendix and any problems found will be reported to the project manager and addressed immediately.

4.1.2 Weekly Inspections

While the landfill is in operation, it must be inspected weekly and after significant storms to detect evidence of any deterioration, malfunctions, or improper operation of run-on and runoff control systems, and the proper functioning of or presence of liquids in the leachate collection and leak detection system. When in use, the temporary liner cover that is used between construction seasons prior to permanent closure of the Phase 2 Cell will be examined for signs of damage and seam separation. Anchor trenches around the perimeter of

the cover will be inspected for liner pullout. Sandbags will be inspected for proper spacing and damage. The temporary liner that will cap the CAMU Phase 2 Cell between construction seasons will be fenced and kept secured to help ensure the cap is not disturbed by people or large animals. Inspection of the perimeter fence, gates, condition of haul roads, condition of storm water pond, presence of precipitation run-off or ponded liquids, condition of decontamination pads, and the condition of haul trucks will be included in weekly inspections and any maintenance needed will be recorded on the Weekly Inspection Form included in Attachment B of this Appendix and addressed appropriately.

5.0 SITE MAINTENANCE

5.1 CAMU TEMPORARY CAP

On-site maintenance items are to include repairs to the liner, seams, and sandbags. Cover liner integrity and anchorage are the primary focus of scheduled inspection and preventative maintenance. Periodic inspection of other features, such as above-ground portions of monitoring wells and storm water controls, will also be required.

5.1.1 Housekeeping

Liner Anchorage – Sandbags or tubes that are used to anchor the flexible membrane liner cap over the CAMU cell may need periodic adjustment to ensure they maintain proper spacing.

5.1.2 Corrective Maintenance

The following section covers some problems that may be encountered prior to permanent closure of the cell by construction of a permanent cap. The solutions are by no means all inclusive, but should serve as general guidelines indicating the elements involved for fixing typical case conditions.

1. Subsidence - When an area experiences excessive localized settlement, the cover may no longer drain properly. Even so, there may not be a problem unless the area is large, there is continued ponding, or the flexible membrane liner has been damaged. If it is determined that a repair must be made, the necessary steps involved are:

    a. Determine limits of area to be repaired.
    b. Remove sandbags or tubes from area.
    c. Cut and remove flexible membrane liner.
    d. Fill depression and grade for proper drainage.
    e. Install and seam new flexible membrane liner.
    f. Test seams to ensure integrity of repair.
    g. Replace sandbags or tubes to anchor flexible membrane liner.

2. Rips and tears - Repair of rips and tears in the liner cap is necessary not only to prevent water from leaking through to the underlying cell but also to prevent wind from getting under the liner. If allowed to get under the liner, high winds may inflate the surface of the flexible membrane cap to a point where sand bags will be dislodged.
3. Seam separation – Repair of separating or inadequately sealed seams is necessary for the same reasons as repair of rips and tears in the liner. Seams can be temporarily repaired using seaming tape, but should be permanently repaired by hot-air welding or sewing as soon as a liner installer can be called to the site.
4. Liner anchorage – High winds may cause liner edges to pull out or sandbags or tubes to displace. If this occurs, anchor trenches will be excavated, liner edges reinstalled, and the trench filled and compacted in accordance with the liner installation plans. Sandbags or tubes will be repositioned to provide evenly spaced anchorage on the cap liner.

5.1.3 Groundwater

Pre-closure CAMU monitoring will be accomplished in accordance with Appendix D – Sampling and Monitoring Plan. During quarterly groundwater monitoring events, components of the groundwater monitoring system will be visually inspected to ensure good working order. All inspections will be documented on the Inspection/Repair form included in Attachment B of Appendix D and included in the annual report. If any problems with the groundwater monitoring system are encountered, they will be documented on the Inspection/Repair form and the owner/operator will be notified within 24 hours. The owner/operator is responsible for making sure all repairs are scheduled and completed within 14-calendar days of the inspection. Details of completed repairs will be noted on the Inspection/Repair form. The owner/operator is also responsible for reporting any significant issues to the EPA representative verbally within 7-calendar days and in writing within 14-calendar days.

ATTACHMENT C

SAMPLING AND ANALYSIS PLAN

ATTACHMENT C

SAMPLING AND ANALYSIS PLAN

Prepared for:

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Prepared by:

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June 2007
Revised August 2007

ATTACHMENT C

SAMPLING AND ANALYSIS PLAN

1.0 INTRODUCTION

This Sampling and Analysis Plan is designed in order to collect representative samples of waste being hauled and placed in the CAMU Phase 2 Cell. This Plan provides the methodology and procedures for each task presented in the plan. The follow tasks will be conducted to obtain representative samples of waste and to characterize the waste being hauled to the CAMU Phase 2 cell:

- Description of payload inside sampled trucks;
- Grab sampling of wood, dirt, dust, brick, and concrete materials; and
- Laboratory analyses of collected grab samples.

2.0 SAMPLING METHODOLOGY

2.1 SAMPLING FREQUENCY AND PROCEDURES

Demolition waste being hauled to the CAMU Phase 2 Cell from disposal will be sampled from the payload of the haul truck, after the haul truck has been weighed but prior to the haul truck leaving the Smelter facility.

During cleaning and demolition work at the Smelter facility, 13 work areas, will have waste removed and transported to the CAMU Phase 2 Cell. These work areas are presented in Table 1. Work area designations are based on the contractors schedule for demolition, processes that occurred

TABLE 1. WORK AREAS

Work Area	Buildings Included	Stage of Demolition	Material Volume (cubic yards)	Number of Haul Trucks (assume 15 yards/truck)*	Minimum Number of Samples (1/20 trucks)**
1	Contractor's Lunchroom, North End Highline Railroad, Garage, Contractor's Change House, Main Office, Main Natural Gas Valve House.	Stage 1	1,190	80	4
2	Dross Plant Baghouse and 200' Stack, Blast Furnace Building.	Stage 1	270	18	1
3	Thawhouse.	Stage 1	980	66	4
4	Blast Furnace Flue, Monier Flue.	Stage 2	7,900	527	27
5	Acid Plant Cooling Tower, Truck Loading and Spray Dryer Building, Sand Filters, Auto Shop, Acid Plant Shop, Ringling Dust Building.	Stage 2	1,350	90	5
6	400' D&L Stack, 200' Acid Stack, 425' Blast Furnace Stack	Stage 2	6,890	460	23
7	Acid Plant, Pump Tank Building, Main Blower Building.	Stage 2	1,000	67	4
8	Blast Furnace Baghouse.	Stage 2	4,120	275	14
9	Ore Unloading Building, Crushing Mill, Sample Mill.	Stage 2	14,100	940	47
10	Materials Stored in Concentrate Storage and Handling Building, Coverall Buildings, and Direct Smelt Building.	Throughout	14,000	934	47
11	Highline Railroad Remainder, Blast Furnace Office, Power House, Blast Furnace Heat Exchanger, Machine Shop, Direct Smelt Building, Breaking Floor, Locomotive Crane Shed, Blast Furnace Lunchroom, Pump House, Blacksmith Shop, Carpenter Shop, Abandoned Breaking Floor, Sinter Stockpile Building, Charge Building, Cement & Dust Silos.	Alternate A	2,415	161	9
12	Masons Shop, Motor and Paint Shop, Paint Storage Building, Meeting Room, Oil HS, Refractory Storage, Zinc Plant O_2 Building, Zinc Power House, Zinc Pump House, Shop Lunch Room, and Truck Scale.	Alternate B	848	57	3

TABLE 1. WORK AREAS (continued)

13 Misc.	Record Storage, Warehouse Annex, Belly Yard Rail, Slag Handling Pad, Warehouse Oil and Oxygen/Acetyl Storage, Warehouse, Environmental Building, Acid Tanks, Coverall Buildings, Truck Scale & High Grade, Railroad ties and timbers, Slag Dump Cleanup, Remediation of Property for American Chemet, Excavation for Plant Cap, Lake Shore Shed, Asarco On-site Sanitary Treatment, Zinc Plant Locomotive Shop, Bath House, Medical Office and Thornock Tank, HDS Water Treatment, Car Wash, Neutralization Building & Acid Sump, Northwestern Energy Sub Station, and Rodeo Tank & Stormwater Sumps, High Lead Welding Shop.	2009-2012	14,305	954	48
		Totals	**69,368**	**4,629**	**236**

Notes:

*Number of haul trucks assumes a 15 cubic yard capacity. Alternative truck haul capacities may be used by the contractor (typically a range of 10 cubic yards to 20 cubic yards).

**The actual number of samples may vary based on the capacity of the haul trucks used and the number of truck loads. The number of samples will be adjusted to the actual number of truckload transported to the CAMU.

in these areas, and the materials used to construct the buildings. A sample will be collected from one out of every 20 trucks hauling waste from each of the 13 work areas. Therefore, at least one sample will be obtained from each of the 13 areas for every 20 haul trucks that transport waste from that area to the CAMU Phase 2 Cell.

Each haul truck payload to be sampled will be visually divided up into five areas. A grab sample will be collected in accordance with Standard Operating Procedures outlined in Attachment 1 at a random location within each of the five areas. If a location within a sampling area can be visually identified to be potentially the worse case for that area, based on the professional judgment of the sampler, the sample will be obtained from that location to bias the sample as the worst case. If based on the sampler's judgment it is not possible to identify a worst case location, the sample will be obtained from a random location. All five samples will be combined to form a representative composite sample of the waste material being hauled. Large pieces of brick and concrete will be sampled by collecting chip samples according to HM-SOP-37. Large pieces of wood and timber will be sampled according to HM-SOP-47. Broken debris, dirt, and dust will be sampled according to HM-SOP-6. All five samples will be combined into one composite sample, mixed thoroughly, and that one composite sample will be sent to the lab and analyzed.

A sampling notebook will be maintained, and will include the location and work area where waste is being hauled from, a description of the materials in the haul truck payload, the sample identification number, and the date and time the sample is taken.

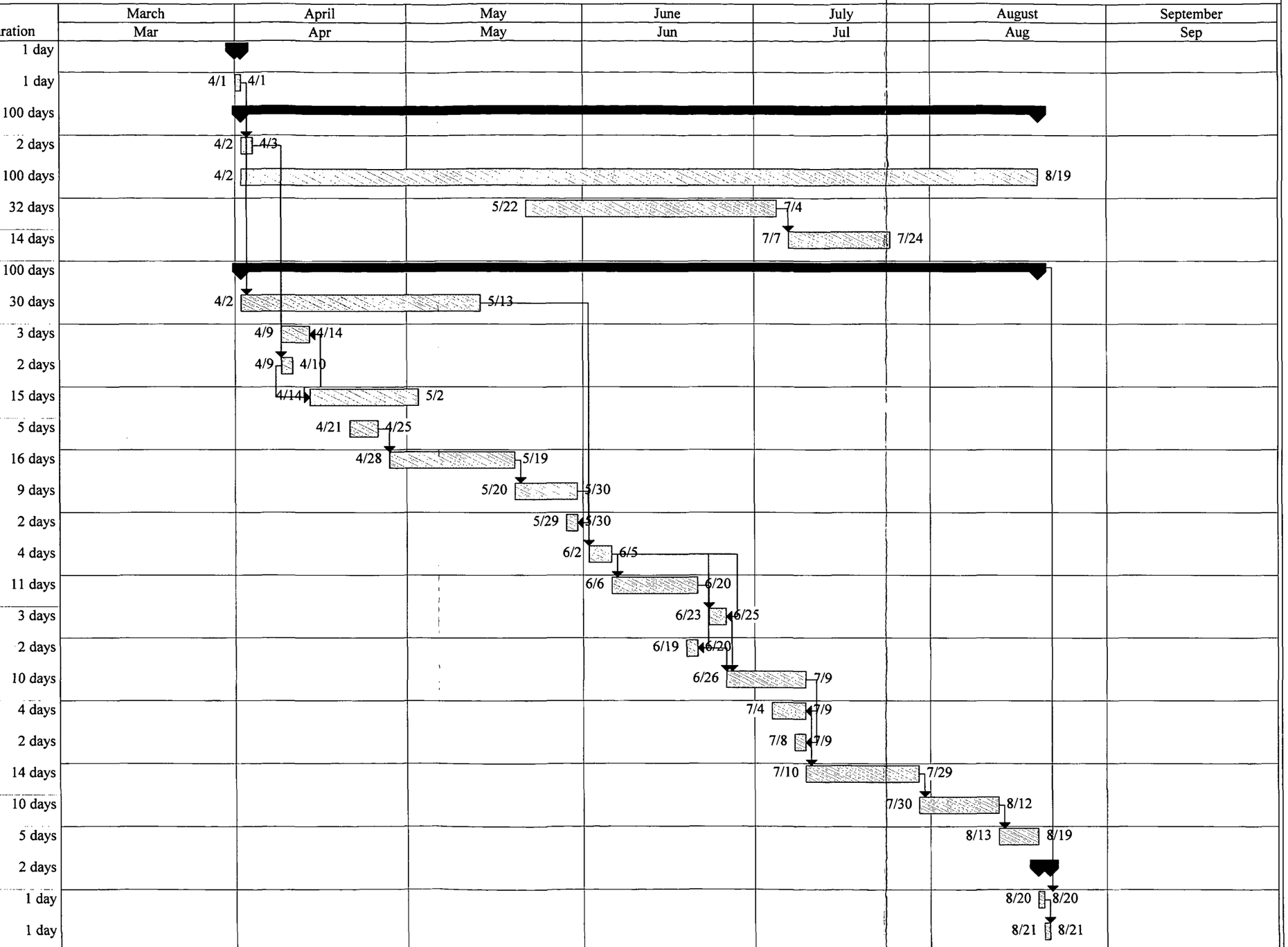
3.0 LABORATORY PROCEDURES

Laboratory analysis will be performed for the eight RCRA metals (Lead, Arsenic, Silver, Selenium, Barium, Chromium, Cadmium, and Mercury) using Toxic Characteristic Leaching Procedure (TCLP) EPA Method 1311.

APPENDIX F 2008 CONSTRUCTION SCHEDULE

Revised August 2007

Task Name	Duration
Contractor Selection	1 day
EPA Approval	1 day
Construction Oversight	100 days
Preconstruction Conference	2 days
Construction Oversight	100 days
Liner Cell QC	32 days
QC Testing	14 days
Construction	100 days
Order Liner	30 days
Mobilization	3 days
Site Layout	2 days
Construct Access Roads	15 days
Strip Topsoil/ Subsoil	5 days
Excavate Soils	16 days
Place/compact CCL	9 days
Grade/roll Surface for GCL	2 days
Install GCL	4 days
Install FML	11 days
Install Geocomposite	3 days
Install Stand Pipe	2 days
Install FML	10 days
Install Stand Pipe	4 days
Install Geocomposite	2 days
Haul Waste	14 days
Place Temporary Cap	10 days
Demobilze	5 days
Project Close Out	2 days
Notice of Completion	1 day
Reporting	1 day



Project: CAMU PHASE 2 CELL
Date: Tue 8/21/07

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks | Group By Summary

Progress | Summary | Rolled Up Milestone | Split | Project Summary

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APPENDIX G

CONSTRUCTION QUALITY ASSURANCE/QUALITY CONTROL PLAN FOR THE ASARCO EAST HELENA CORRECTIVE ACTION MANAGEMENT UNIT (CAMU) PHASE 2 CELL

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May 2007
Revised June 2007
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TABLE OF CONTENTS

LIST OF TABLES iii
LIST OF FIGURES iii
LIST OF APPENDICES iii
1.0 INTRODUCTION 1-1
1.1 PURPOSE 1-1
1.2 SCOPE 1-1
1.3 LIMITATIONS 1-2
2.0 CONSTRUCTION QUALITY ASSURANCE PLAN ELEMENTS 2-1
2.1 CQA/QCP RESPONSIBILITY AND AUTHORITY 2-1
2.1.1 Regulatory Agencies 2-1
2.1.2 Project Owner 2-1
2.1.3 Project Engineer 2-1
2.2 PROJECT RECORDS 2-4
2.3 DATA MANAGEMENT AND DOCUMENT CONTROL 2-4
2.4 MEETINGS 2-5
2.4.1 Pre-Bid Meeting 2-5
2.4.2 Pre-Construction Meeting 2-5
2.4.3 Progress Meetings 2-5
2.5 REPORTING 2-5
3.0 EARTHWORK 3-1
3.1 QUALITY CONTROL MEASURES 3-1
3.2 QUALITY ASSURANCE MEASURES 3-1
4.0 COMPACTED CLAY LINER 4-1
5.0 FLEXIBLE MEMBRANE LINERS 5-1
6.0 GEOCOMPOSITES 6-1
7.0 GCL 7-1
8.0 LEACHATE COLLECTION AND DETECTION SUMPS AND PIPING 8-1
9.0 REFERENCES 9-1

LIST OF TABLES

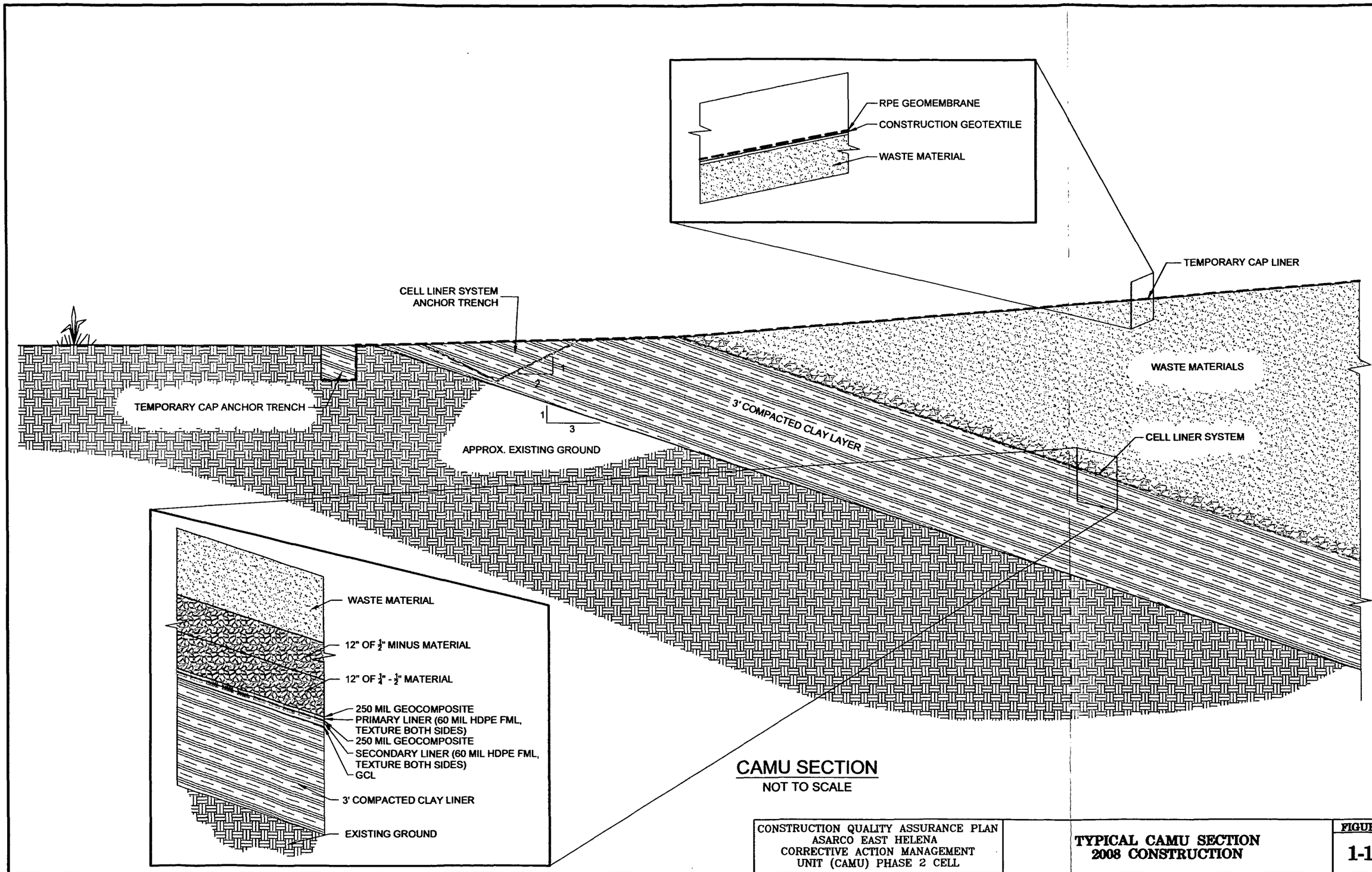
TABLE 2-1. QUALITY ASSURANCE AND QUALITY CONTROL ROLES BY FUNCTIONAL POSITION....2-3
TABLE 3-1. QC TESTS FOR SELECTED EARTHEN AND ASPHALT MATERIALS....3-2
TABLE 4-1. STOCKPILE ACCEPTANCE TESTING....4-2
TABLE 4-2. QC TESTING FOR CCL PLACEMENT....4-3
TABLE 4-3. QA TESTING FOR CCL PLACEMENT....4-5
TABLE 5-1. MANUFACTURER'S QA TESTS FOR FML....5-1
TABLE 5-2. QUALITY CONTROL CRITERIA FOR FML....5-3
TABLE 6-1. CONFIRMATION SAMPLING FOR GEOCOMPOSITES....6-2
TABLE 7-1. ACCEPTANCE TESTING FOR GCL....7-2
TABLE 7-2. QC MEASURES FOR GCL....7-2
TABLE 8-1. QA/QC MEASURES FOR LEACHATE COLLECTION AND DETECTION SUMPS AND PIPING....8-1

LIST OF FIGURES

FIGURE 1-1. TYPICAL CAMU SECTION 2008 CONSTRUCTION....1-3
FIGURE 2-1. CONSTRUCTION QUALITY ASSURANCE FUNCTIONAL ORGANIZATION....2-2

LIST OF APPENDICES

APPENDIX A FIELD FORMS



CAMU SECTION

NOT TO SCALE

CONSTRUCTION QUALITY ASSURANCE PLAN ASARCO EAST HELENA CORRECTIVE ACTION MANAGEMENT UNIT (CAMU) PHASE 2 CELL	**TYPICAL CAMU SECTION 2008 CONSTRUCTION**	**FIGURE** **1-1**

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Hydrometrics, Inc.
Consulting Scientists and Engineers